

Public Support for Street-Scale Urban Design Practices and Policies to Increase Physical Activity

Susan A. Carlson, Roxanna Guide, Thomas L. Schmid, Latetia V. Moore,
Danielle T. Barradas, and Janet E. Fulton

Background: Street-scale urban design policies are recommended to increase physical activity in communities. Our purpose was to examine U.S. public support for local street-scale urban design features and policies. **Methods:** Analysis is based on a cross-sectional national sample of adults ($n = 4682$) participating in the 2006 HealthStyles mail survey. **Results:** About 57% of adults rated local street-scale urban design as highly important in determining the amount of physical activity they obtain. Adjusted odds of rating neighborhood features as having high importance were higher in people aged ≥ 65 years versus those < 65 and minority racial/ethnic groups versus non-Hispanic whites. Two-thirds of adults were willing to take civic action to support local street-scale urban design policy. Adjusted odds of being willing to take any action versus none was higher in non-Hispanic blacks and Hispanics versus non-Hispanic whites, was higher in those with household incomes $\geq \$60,000$ versus $\leq \$15,000$ per year, and increased as education and perceived importance of neighborhood features increased. **Conclusions:** There are high levels of public support for local street-scale urban design policies; however, demographic differences exist in the level of support. These differences are important considerations for policymakers and for those designing community programs targeting street-scale urban design features and policies.

Keywords: public health, environment, survey research

The *Guide to Community Preventive Services* has identified 8 strategies to increase physical activity, including implementing “street-scale urban design/land use policies and practices,” which apply to small geographic areas, usually limited to a few blocks.¹⁻³ Aiming to increase the percentage of people walking, bicycling, and playing outdoors, this strategy calls for ensuring sidewalk continuity, improving street lighting, introducing or enhancing traffic calming elements (eg, center islands, raised crosswalks), and improving the safety and landscaping aesthetics of the street area.¹ The street-scale urban design/land use policies and practices strategy was recommended by the Task Force on Community and Preventive Services after the review of 6 qualified studies that consisted of quasi-experimental pretest or cross-sectional study designs.^{1,2} Overall, the median increase in physical activity using this strategy (eg, change in percentage walking, number active, or number of walkers, path users, or cyclists) was 35% (interquartile range: 16% to 62%).¹ Since this strategy targets populations rather than individuals, even small increases in physical activity can amount to significant

changes in public health at the population level, especially if such increases occur in sedentary populations.³

Public opinion and support is often a proximate cause of policy change or implementation.⁴ For example, public support was instrumental in passing and implementing tobacco taxes and the smoke-free policies aimed at reducing secondhand smoke in the late 1980s.⁵ Researchers have examined public attitude related to: zoning regulations that favor walking and biking,^{6,7} government funding of physical activity supports,⁶⁻⁸ and communities that offer enhancements to physical activity opportunities.^{9,10} To date, public support for local street-scale urban design features and policies associated with physical activity has received little attention and, has not been fully addressed.

This study sought to examine the level of support and the correlates of support for local street-scale urban design policies and practices among U.S. adults. Our study used a national sample of the U.S. adult population to identify sociodemographic correlates related to (1) individuals' rated importance of neighborhood features (eg, street lighting, sidewalks, crosswalks) in determining how much physical activity they normally get, and (2) their willingness to take civic actions (eg, write letters, pay more in taxes, run for public office) to support local policy changes and practices that are aimed at improving neighborhood features. Because people who rate neighborhood features as having high importance may be more likely to report being willing to take civic

The authors are with the Division of Nutrition, Physical Activity, and Obesity, Centers for Disease Control and Prevention, Atlanta, GA.

action, we also examined the association between rated importance and willingness to take action, adjusted for demographic variables.

Methods

Survey and Analytical Sample

The survey data used in this study were obtained from the 2006 Styles database managed by Porter Novelli, a public relations firm (Washington, DC). Styles 2006 is based on consumer mail panel surveys administered in 2 waves. The surveys are conducted annually in English and are designed to assess people's health-related attitudes, health behavior, consumer behavior, and media habits.¹¹ The sampling and data collection are conducted by Synovate, Inc. (Chicago, IL). Synovate annually recruits approximately 450,000 households in the U.S. to be part of the Synovate mail panel survey and participants agree to participate in periodic mail surveys in exchange for gifts, such as 2 dollars cash and a lottery chance to win \$50–\$1000 per completed survey.

Demographic data used in the analysis were collected during the first wave of data collection using the ConsumerStyles survey. From May through June 2006, the survey was mailed to 20,000 potential adult respondents who were selected through a stratified random sampling of the Synovate mail panel. The main sample ($n = 11,000$) was stratified by region, household income, population density, age, and household size to create a nationally representative sample. In addition to the main sample, there were 2 groups that were oversampled. A low income/minority supplementary sample ($n = 3000$) ensured adequate representation of these groups and a households-with-children supplementary sample ($n = 6000$) ensured adequate numbers of respondents for a follow-up survey focusing on children. Of the 20,000 households that were sent ConsumerStyles surveys, 13,260 returned the survey, yielding an overall response rate of 66.3% (main sample: 66.3%, low/income minority supplementary sample: 63.5%, households-with-children supplementary sample: 66.8%).

Data on the rated importance of neighborhood features in determining physical activity, and about the actions respondents would be willing to take to support policies aimed at improving neighborhood features were collected as part of the HealthStyles survey which was administered during the second wave of surveys from late June through early August 2006. The HealthStyles survey was sent to 6600 randomly selected ConsumerStyles respondents. Of these households, 5251 (79.6%) responded and this was the basis for our study population. Respondents were excluded, first if they did not answer the questions on neighborhood features ($n = 195$), and then if they did not answer questions on any covariates of interest ($n = 374$). The final analytic sample consisted of 4682 adults. Sample characteristics of the full HealthStyles sample and our analytic sample did not differ.

Measures

Before being asked the survey questions related to neighborhood features, all respondents were provided with the following definition: "Your neighborhood is defined as the area within one-half mile or a 10-minute walk from your home."

Demographic Characteristics. Categorical variables were constructed for age group (18–34, 35–44, 45–54, 55–64, and 65+ years), race/ethnicity (non-Hispanic white; non-Hispanic black; Hispanic; and Other), education level (high school graduate or less, some college, and college graduate), household income (<\$15,000, \$15,000–\$24,999, \$25,000–\$39,999, \$40,000–\$59,999, and \$60,000+), and home ownership (homeowner and nonhomeowner). Body mass index (BMI), calculated from self-reported height and weight, was defined as underweight/normal weight (<25.0 kg/m²), overweight (25.0 to 29.9 kg/m²), and obese (≥ 30 kg/m²).¹² Physical inactivity was defined as no moderate or vigorous-intensity physical activity (eg, walking, biking, running, aerobics, yard work, or anything else that causes increases in breathing or heart rate) for at least 10 minutes in a usual week and categorized as yes or no.

Rated Importance of Neighborhood Features in Determining Physical Activity. Respondents were asked "how would you rate the importance of features in your neighborhood, such as sidewalks, crosswalks, or lighting in determining how much physical activity you normally get?" Response categories included: not important, somewhat important, moderately important, and very important. Responses were collapsed into 2 categories: low importance (ie, not important, somewhat important) and high importance (ie, moderately important, very important).

Actions in Support of Local Policy Aimed at Improving Neighborhood Features. Respondents were asked "what would you be willing to do to support urban design policies to improve local street lighting, sidewalks, crosswalks, and/or bicycle lanes?" Respondents were instructed to select all that applied from a list of 4 actions: nothing, write letters to elected officials, pay more in property taxes, and run for public (or elected) office. A variable was created that placed individuals into 5 mutually exclusive categories: (1) nothing, (2) write letters to elected officials only, (3) pay more in property taxes only, (4) write and pay, and (5) run for public (or elected) office (alone or in combination with one or more other actions). Individuals who reported that they would be willing to run for public (or elected) office alone or in combination with one or more actions were included in one category due to the small number of adults reporting that they would be willing to run for public office. Of 169 respondents reporting that they would be willing to run for public office, 55 reported that they would be willing to run for office alone, 73 reported that they would be willing to run and write

letters, 9 reported that they would be willing to run and pay more in taxes, and 32 reported all 3 actions.

Statistical Analysis

We examined both the prevalence of the rated importance of neighborhood features in determining physical activity and the actions participants were willing to do in support of local policy aimed at improving neighborhood features by demographic characteristics (ie, sex, age, race/ethnicity, education, income, homeownership, physical inactivity, and BMI category). Data were weighted to U.S. census population projections for 2005 by sex, age, income, race/ethnicity, and household size. To compare prevalence estimates between demographic subgroups, pairwise comparisons were performed to calculate *t*-statistics, and differences were considered significant if *P* values were < 0.05.

Multivariate logistic regression analyses were conducted to examine the odds ratios (ORs) of rating the importance of neighborhood features in determining physical activity as high versus low by demographic characteristics. Two models were created to examine the association of demographic characteristics and rated importance with willingness to take action. The first model was a binomial model that examined the OR of willingness to do anything versus nothing and the second model was a multinomial model that examined the willingness to do specific actions (write letters to elected officials only, pay more in property taxes only, write and pay, and run for public office) versus nothing. Adjusted models included sex, age, race/ethnicity, education, homeownership, physical inactivity, and BMI category. Due to the high correlation between income and education level, models that examined income did not include education level. Models examining willingness to take action also included rated importance of neighborhood features. Analyses were conducted using SUDAAN, version 9.0 (Research Triangle Institute, Research Triangle Park, NC).

Results

A majority of participants were non-Hispanic whites, were 35 to 54 years of age, had household incomes greater than \$40,000, and were homeowners (Table 1). The demographic distribution of the unweighted sample differed slightly from that of the sample weighted to the U.S. adult population.

A majority of adults (56.6%) rated their neighborhood features as having high importance (ie, moderately or very important) in determining physical activity levels (Table 2). The adjusted odds of rating neighborhood features as having high importance versus low importance was higher in people 65 years and older compared with all other age groups, lower among people physically inactive versus not, and higher in non-Hispanic blacks, Hispanics, and Other race/ethnicities compared with non-Hispanic

whites. Odds of rating neighborhood features as having high importance versus low importance did not differ significantly by sex, education, household income, home ownership, or BMI category.

About two-thirds of adults were willing to take one or more civic actions to support local policy aimed at improving neighborhood features (Table 3). More than 40% were willing to write letters only, 16.1% were willing to pay more in taxes only, 5.9% were willing to write letters and pay more in taxes, and 4.0% were willing to run for office [alone (1.2%) or in combination with one or more other actions (2.8%)].

The adjusted odds of being willing to do something versus doing nothing was higher in non-Hispanic blacks and Hispanics versus non-Hispanic whites, was higher in those with household incomes of \$60,000 or more versus \$15,000 or less per year, and increased as education level increased (*P* for trend < 0.001) (Table 4). Similar differences by race/ethnicity, education, and household income were observed when examining odds of the willingness to take specific actions versus doing nothing: non-Hispanic blacks and Hispanics were more likely than non-Hispanic whites to write letters only, non-Hispanic blacks were more likely than non-Hispanic whites to run for public office than do nothing; college graduates were more likely than noncollege graduates to pay more in taxes only, to pay more in taxes and write letters, and to run for office; individuals with incomes > \$60,000 were more likely to be willing to pay more in taxes only and in combination with writing letters than individuals with incomes < \$15,000 or \$15,000–\$24,999. Although there were no significant differences by sex and age group in the willingness to take any action versus nothing, there were significant differences when the willingness to take specific actions was examined: men were more likely than women to run for public office (alone or in combination) and individuals over 65 years of age were more likely to write letters and pay more in property taxes than those 18 to 34 and 35 to 44 years of age. There were no significant differences by homeownership, BMI category, or physical inactivity in the willingness to take specific actions versus nothing or to take any action versus nothing.

The odds of being willing to take any action versus do nothing and the odds of being willing to take specific actions versus doing nothing significantly increased as adults' rated importance of their neighborhood features in determining levels of physical activity they obtained increased (*P* for trend < 0.001, Table 4). When comparing those rating neighborhood features as very important versus those rating features as not important, the magnitude of the association was higher for those willing to do activities of higher commitment (write letters and pay more property taxes, OR: 31.9; run for public or elected office, OR: 24.7) than those willing to do activities of lower commitment (ie, write letters to elected officials only, OR: 9.9; pay more in property taxes only, OR: 9.5; versus doing nothing).

Table 1 Study Participant Characteristics (n = 4682), HealthStyles 2006

Characteristic	n	Sample %	Weighted	
			%	95% CI
Total	4682	100	100	
Sex				
Men	2090	44.6	47.5	45.7, 49.4
Women	2592	55.4	52.5	50.6, 54.3
Age group				
18–34 yrs	758	16.2	31.2	29.2, 33.3
35–44 yrs	1199	25.6	20.2	19.0, 21.4
45–54 yrs	1155	24.7	19.5	18.3, 20.7
55–64 yrs	729	15.6	13.5	12.5, 14.5
65+ yrs	841	18.0	15.6	14.6, 16.8
Race/ethnicity				
White, non-Hispanic	3186	68.0	69.3	67.6, 71.0
Black, non-Hispanic	549	11.7	11.4	10.3, 12.7
Hispanic	638	13.6	12.5	11.4, 13.8
Other ^a	309	6.6	6.7	5.7, 7.7
Education level				
High school graduate or less	1536	32.8	31.5	29.8, 33.2
Some college	1756	37.5	37.7	36.0, 39.5
College graduate	1390	29.7	30.8	29.2, 32.5
Household income (\$)				
Under 15,000	756	16.1	12.3	11.2, 13.5
15,000–24,999	505	10.8	12.9	11.6, 14.3
25,000–39,999	695	14.8	17.6	16.1, 19.1
40,000–59,999	777	16.6	17.9	16.5, 19.5
60,000+	1949	41.6	39.3	37.6, 41.0
Home ownership				
Homeowner	3674	78.5	74.0	72.1, 75.8
Nonhomeowner	1008	21.5	26.0	24.2, 27.9
Body mass index (BMI)				
Underweight/normal weight	1492	31.9	33.9	32.1, 35.7
Overweight	1588	33.9	33.2	31.5, 34.9
Obese	1602	34.2	32.9	31.2, 34.7
Physical inactivity				
Yes	677	14.5	13.9	12.7, 15.2
No	4005	85.5	86.1	84.8, 87.3

^a Other race includes: American Indian, Alaska Native, Asian, Native Hawaiian, and other Pacific Islander.

Discussion

There is empirical evidence that street-scale urban design features are beneficially associated with higher physical activity levels.^{1,13,14} The current study found that there are high levels of public support for local street-scale urban design policies among U.S. adults. In addition, our study found that the majority of adults rated neighborhood features as having high importance in determining the

amount of physical activity obtained and were willing to take civic action to improve neighborhood features, with some differences by demographic characteristics. Regardless of demographic differences, the biggest factor in determining a person's willingness to take civic action to improve neighborhood features was how important that person rated neighborhood features to be in determining her or his level of physical activity. Modifying environmental factors related to street-scale urban design will

Table 2 Rated Importance of Neighborhood Features in Determining Amount of Physical Activity by Select Characteristics, HealthStyles 2006^a

Characteristic	Low importance				High importance				High importance versus low importance	
	Not important		Somewhat important		Moderately important		Very important		OR ^b	95%CI
	%	95% CI	%	95% CI	%	95% CI	%	95% CI		
Total	21.3	19.8, 22.8	22.1	20.6, 23.7	24.6	23.1, 26.2	32.0	30.4, 33.7		
Sex										
Men	23.2	21.0, 25.6	22.2	19.9, 24.6	25.7	23.5, 28.0	28.9	26.6, 31.3	0.88	0.75, 1.02
Women	19.5	17.5, 21.6	22.1	20.0, 24.3	23.7	21.6, 25.9	34.8	32.5, 37.1	1.00	Referent
Age group										
18–34 yrs	18.9	15.4, 22.9	25.5	21.7, 29.8	23.6	20.0, 27.7	32.0	28.1, 36.1	0.61	0.47, 0.78
35–44 yrs	22.5	19.9, 25.2	20.4	18.1, 23.0	25.2	22.6, 27.9	31.9	29.1, 34.9	0.74	0.61, 0.90
45–54 yrs	24.2	21.7, 27.0	22.7	20.2, 25.4	23.5	20.9, 26.2	29.6	26.9, 32.6	0.65	0.53, 0.80
55–64 yrs	22.3	19.2, 25.7	21.1	18.0, 24.5	23.4	20.3, 26.8	33.3	29.7, 37.0	0.77	0.62, 0.96
65+ yrs	19.9	17.2, 23.0	17.6	15.0, 20.5	28.5	25.3, 31.9	34.0	30.7, 37.5	1.00	Referent
Race/ethnicity										
White, non-Hispanic	25.0	23.1, 26.9	23.5	21.7, 25.4	24.6	22.8, 26.5	26.9	25.1, 28.8	1.00	Referent
Black, non-Hispanic	13.0	9.2, 18.1	14.7	10.5, 20.1	21.9	17.8, 26.6	50.5	44.7, 56.2	2.39	1.76, 3.25
Hispanic	12.0	8.8, 16.2	20.7	16.8, 25.3	26.7	22.1, 31.9	40.6	35.8, 45.5	1.98	1.55, 2.53
Other ^c	14.0	10.2, 19.0	23.1	16.1, 32.1	25.9	20.4, 32.2	37.0	29.9, 44.6	1.67	1.19, 2.36
Education level										
High school graduate or less	19.2	16.8, 21.9	22.0	19.2, 25.1	26.9	24.0, 30.0	31.9	28.9, 35.1	1.16	0.96, 1.41
Some college	20.8	18.4, 23.4	22.2	19.7, 24.9	25.0	22.5, 27.7	32.0	29.4, 34.7	1.06	0.89, 1.27
College graduate	23.9	21.3, 26.8	22.1	19.6, 24.9	21.9	19.5, 24.4	32.1	29.3, 34.9	1.00	Referent
Household income (\$)										
Under 15,000	20.3	16.3, 25.0	21.2	17.1, 26.1	21.2	17.9, 25.0	37.2	32.6, 42.0	0.90	0.69, 1.17
15,000–24,999	20.7	15.6, 26.8	20.8	16.6, 25.7	27.5	22.7, 32.9	31.1	26.5, 36.1	0.93	0.70, 1.23
25,000–39,999	19.3	15.8, 23.3	23.3	19.4, 27.8	25.8	21.7, 30.5	31.6	27.3, 36.2	0.95	0.75, 1.20
40,000–59,999	19.0	15.8, 22.6	21.9	18.0, 26.3	27.3	23.3, 31.7	31.8	27.8, 36.1	1.12	0.90, 1.40
60,000+	23.7	21.6, 25.9	22.4	20.2, 24.7	23.0	21.0, 25.1	30.9	28.7, 33.3	1.00	Referent
Home ownership										
Homeowner	23.2	21.6, 24.9	22.0	20.4, 23.7	24.8	23.2, 26.5	30.0	28.4, 31.8	1.00	Referent
Nonhomeowner	15.8	12.6, 19.6	22.5	18.9, 26.5	24.2	20.7, 28.1	37.5	33.5, 41.7	1.21	0.98, 1.49
Body mass index (BMI)										
Underweight/normal weight	22.7	19.9, 25.7	21.2	18.6, 24.1	24.7	22.0, 27.7	31.4	28.5, 34.4	1.00	Referent
Overweight	20.1	17.9, 22.6	24.5	21.8, 27.5	25.1	22.6, 27.8	30.2	27.7, 32.9	0.97	0.80, 1.17
Obese	21.0	18.4, 23.7	20.6	18.1, 23.2	24.1	21.5, 26.8	34.4	31.4, 37.4	1.07	0.89, 1.30
Physical inactivity										
Yes	20.1	16.6, 24.2	24.7	20.7, 29.1	23.7	19.8, 27.9	31.6	27.2, 36.3	1.00	Referent
No	21.4	19.8, 23.2	21.7	20.0, 23.4	24.8	23.1, 26.5	32.1	30.3, 33.9	1.27	1.02, 1.57

^a Respondents were asked to rate the importance of neighborhood features, such as sidewalks, crosswalks, or lighting, in determining how much physical activity they normally get.

^b Models included sex, age group, race/ethnicity, education level, physical inactivity, and BMI, except for results presented by household income, which did not include education level.

^c Other race includes: American Indian, Alaska Native, Asian, Native Hawaiian, and other Pacific Islander.

Table 3 Willingness to Take Civic Actions in Support of Local Policy Aimed at Improving Neighborhood Features by Select Characteristics, HealthStyles 2006^a

Characteristic	Nothing		Write letters to elected officials only		Pay more in property taxes only		Write letters and pay more property taxes		Run for public (or elected) office (alone or combination) ^b	
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI
Total	33.4	31.6, 35.1	40.7	38.9, 42.5	16.1	14.9, 17.4	5.9	5.2, 6.7	4.0	3.3, 4.8
Sex										
Men	34.7	32.3, 37.3	36.6	34.0, 39.3	17.9	16.1, 20.0	5.5	4.6, 6.7	5.2	4.1, 6.6
Women	32.1	29.7, 34.6	44.4	41.9, 46.9	14.4	12.9, 16.2	6.2	5.2, 7.3	2.9	2.2, 3.9
Age group										
18–34 yrs	33.9	29.7, 38.4	42.5	38.1, 47.0	14.1	11.4, 17.3	4.4	3.2, 6.2	5.1	3.5, 7.3
35–44 yrs	33.6	30.7, 36.6	39.8	36.8, 42.9	17.6	15.4, 20.1	4.8	3.7, 6.2	4.2	3.1, 5.6
45–54 yrs	35.4	32.5, 38.5	37.7	34.8, 40.7	15.6	13.4, 18.0	7.2	5.7, 9.0	4.1	3.0, 5.5
55–64 yrs	32.6	29.0, 36.3	38.9	35.2, 42.7	17.7	14.8, 21.0	7.7	5.9, 10.0	3.2	2.1, 4.8
65+ yrs	30.0	26.8, 33.4	43.4	39.9, 47.0	17.4	14.8, 20.4	6.8	5.2, 9.0	2.3	1.4, 3.8
Race/ethnicity										
White, non-Hispanic	36.8	34.7, 38.9	36.7	34.6, 38.8	17.6	16.1, 19.3	5.7	5.0, 6.6	3.2	2.5, 4.0
Black, non-Hispanic	20.0	15.8, 25.0	58.8	53.2, 64.2	9.4	6.9, 12.7	5.5	3.7, 8.2	6.3	4.1, 9.5
Hispanic	26.1	21.8, 31.0	47.8	42.6, 53.0	15.0	11.9, 18.7	5.3	3.7, 7.6	5.8	3.6, 9.2
Other ^c	34.2	27.3, 41.8	37.6	30.4, 45.5	14.2	10.1, 19.7	8.7	5.1, 14.6	5.3	2.9, 9.7
Education level										
High school graduate or less	37.4	34.2, 40.7	45.7	42.3, 49.1	10.8	9.0, 13.0	2.8	2.1, 3.8	3.2	2.1, 4.9
Some college	33.9	31.0, 36.9	41.0	38.0, 43.9	15.9	13.9, 18.1	5.9	4.8, 7.3	3.3	2.4, 4.6
College graduate	28.6	25.9, 31.4	35.2	32.2, 38.3	21.8	19.4, 24.3	8.9	7.4, 10.6	5.6	4.3, 7.2
Household income (\$)										
Under 15,000	38.0	33.2, 43.2	45.9	41.0, 50.8	9.2	6.8, 12.4	2.8	1.8, 4.5	4.0	2.5, 6.4
15,000–24,999	32.5	27.3, 38.2	48.8	43.1, 54.6	9.4	6.6, 13.1	4.6	3.1, 6.8	4.7	2.6, 8.4
25,000–39,999	33.1	28.8, 37.8	41.4	36.6, 46.4	16.0	12.9, 19.7	5.5	3.9, 7.7	4.0	2.5, 6.2
40,000–59,999	33.4	29.1, 38.0	41.3	36.7, 46.0	16.4	13.5, 19.9	5.7	4.2, 7.7	3.2	1.9, 5.3
60,000+	32.3	29.9, 34.7	35.8	33.4, 38.2	20.4	18.4, 22.5	7.5	6.3, 8.9	4.2	3.2, 5.3
Home ownership										
Homeowner	34.2	32.3, 36.1	38.0	36.1, 39.9	17.8	16.4, 19.3	6.5	5.7, 7.4	3.5	2.9, 4.3
Nonhomeowner	31.0	27.2, 35.2	48.3	44.0, 52.7	11.3	8.9, 14.3	4.0	2.7, 5.8	5.4	3.7, 7.7
Body mass index (BMI)										
Underweight/ normal weight	33.8	30.7, 37.0	39.9	36.7, 43.2	16.5	14.2, 19.0	5.7	4.5, 7.2	4.2	2.9, 5.9
Overweight	32.7	30.0, 35.6	40.6	37.6, 43.6	16.8	14.7, 19.0	5.7	4.6, 7.0	4.2	3.2, 5.5
Obese	33.5	30.5, 36.7	41.6	38.5, 44.7	15.1	13.0, 17.4	6.2	5.0, 7.6	3.6	2.7, 4.9
Physical inactivity										
Yes	36.6	32.2, 41.3	42.0	37.2, 47.0	13.2	10.5, 16.5	5.0	3.5, 7.2	3.1	1.8, 5.5
No	32.8	31.0, 34.7	40.5	38.5, 42.4	16.6	15.2, 18.0	6.0	5.2, 6.9	4.1	3.4, 5.0

^a Respondents were asked to indicate which of the following 4 activities (nothing, write letters to elected officials, pay more in property taxes, and run for public (or elected) office) they would do to support urban design policies to improve local street lighting, sidewalks, crosswalks, and/or bicycle lanes. Respondents could select multiple activities from the list.

^b Overall 1.2% reported they were willing to run for office alone, 0.3% reported that they were willing to run and pay more in taxes, 1.7% reported they were willing to run and write letters, and 0.8% reported that they were willing to run, pay more in taxes, and write letters.

^c Other race includes: American Indian, Alaska Native, Asian, Native Hawaiian, and other Pacific Islander.

Table 4 Willingness to Take Any Civic Action and Willingness to Take a Specific Action to Support Local Policy Aimed at Improving Neighborhood Features, HealthStyles 2006^a

Characteristic	Binomial model		Multinomial model (Versus nothing)							
	Willingness to take any action versus nothing		Write letters to elected officials only		Pay more in property taxes only		Write letters and pay more property taxes		Run for public (or elected) office (alone or combination)	
	OR ^b	95% CI	OR ^b	95% CI	OR ^b	95% CI	OR ^b	95% CI	OR ^b	95% CI
Rated importance of neighborhood features in determining amount of physical activity ^c										
Not important	1.00	Referent	1.00	Referent	1.00	Referent	1.00	Referent	1.00	Referent
Somewhat important	2.63	2.08, 3.33	2.65	2.00, 3.52	2.17	1.55, 3.03	5.40	2.92, 9.96	2.90	1.33, 6.33
Moderately important	4.51	3.55, 5.72	4.12	3.12, 5.44	4.26	3.09, 5.87	10.37	5.71, 18.83	7.30	3.47, 15.38
Very important	11.12	8.71, 14.20	9.92	7.50, 13.12	9.50	6.83, 13.22	31.87	17.91, 56.70	24.67	12.58, 48.37
Sex										
Men	0.96	0.80, 1.14	0.84	0.69, 1.02	1.18	0.94, 1.49	0.84	0.62, 1.14	1.94	1.26, 2.99
Women	1.00	Referent	1.00	Referent	1.00	Referent	1.00	Referent	1.00	Referent
Age group										
18–34 yrs	0.82	0.62, 1.09	0.80	0.59, 1.08	0.84	0.58, 1.22	0.60	0.36, 0.99	1.95	0.99, 3.81
35–44 yrs	0.85	0.67, 1.07	0.83	0.65, 1.06	0.92	0.67, 1.25	0.59	0.38, 0.93	1.55	0.83, 2.91
45–54 yrs	0.83	0.66, 1.04	0.80	0.63, 1.03	0.79	0.58, 1.08	0.88	0.57, 1.36	1.57	0.84, 2.92
55–64 yrs	0.89	0.69, 1.15	0.86	0.65, 1.13	0.90	0.64, 1.27	0.96	0.60, 1.53	1.21	0.61, 2.43
65+ yrs	1.00	Referent	1.00	Referent	1.00	Referent	1.00	Referent	1.00	Referent
Race/ethnicity										
White, non-Hispanic	1.00	Referent	1.00	Referent	1.00	Referent	1.00	Referent	1.00	Referent
Black, non-Hispanic	1.81	1.31, 2.49	2.17	1.55, 3.03	0.87	0.56, 1.34	1.37	0.81, 2.29	2.50	1.41, 4.43
Hispanic	1.34	1.02, 1.75	1.44	1.08, 1.93	1.05	0.73, 1.51	1.17	0.73, 1.87	1.82	0.98, 3.38
Other ^d	0.83	0.57, 1.21	0.85	0.55, 1.32	0.64	0.40, 1.03	1.15	0.60, 2.22	1.03	0.48, 2.21
Education level										
High school graduate or less	0.55	0.44, 0.69	0.79	0.62, 1.00	0.33	0.25, 0.45	0.21	0.14, 0.31	0.33	0.19, 0.57
Some college	0.68	0.55, 0.84	0.82	0.64, 1.04	0.57	0.44, 0.75	0.51	0.36, 0.72	0.41	0.26, 0.66
College graduate	1.00	Referent	1.00	Referent	1.00	Referent	1.00	Referent	1.00	1.00, 1.00
Household income (\$)										
Under 15,000	0.57	0.42, 0.76	0.73	0.54, 1.00	0.34	0.22, 0.54	0.25	0.14, 0.46	0.60	0.31, 1.18
15,000–24,999	0.81	0.59, 1.10	1.05	0.75, 1.47	0.42	0.27, 0.66	0.54	0.31, 0.93	0.94	0.45, 1.95
25,000–39,999	0.81	0.62, 1.05	0.90	0.67, 1.21	0.72	0.51, 1.00	0.64	0.40, 1.02	0.74	0.40, 1.37
40,000–59,999	0.81	0.64, 1.04	0.92	0.71, 1.21	0.71	0.52, 0.97	0.67	0.43, 1.04	0.57	0.31, 1.05
60,000+	1.00	Referent	1.00	Referent	1.00	Referent	1.00	Referent	1.00	Referent
Home ownership										
Homeowner	1.00	Referent	1.00	Referent	1.00	Referent	1.00	Referent	1.00	Referent
Nonhomeowner	0.99	0.78, 1.26	1.11	0.86, 1.44	0.72	0.51, 1.01	0.68	0.43, 1.07	1.31	0.79, 2.19
Body mass index (BMI)										
Underweight/ normal weight	1.00	Referent	1.00	Referent	1.00	Referent	1.00	Referent	1.00	Referent
Overweight	1.03	0.83, 1.28	1.05	0.83, 1.33	0.99	0.75, 1.30	0.99	0.68, 1.43	1.02	0.62, 1.67
Obese	0.98	0.79, 1.22	0.98	0.77, 1.24	0.97	0.73, 1.28	1.15	0.79, 1.68	0.84	0.50, 1.42
Physical inactivity										
Yes	1.00	Referent	1.00	Referent	1.00	Referent	1.00	Referent	1.00	Referent
No	1.25	0.99, 1.57	1.22	0.95, 1.57	1.27	0.92, 1.74	1.30	0.83, 2.04	1.50	0.83, 2.72

^a Respondents were asked to indicate which of the following 4 activities (nothing, write letters to elected officials, pay more in property taxes, and run for public (or elected) office) they would do to support urban design policies to improve local street lighting, sidewalks, crosswalks, and/or bicycle lanes. Respondents could select multiple activities from the list.

^b Models included sex, age group, race/ethnicity, education level, physical inactivity, and BMI, except for results presented by household income, which did not include education level.

^c Respondents were asked to rate the importance of neighborhood features, such as sidewalks, crosswalks or lighting, in determining how much physical activity they normally get.

^d Other race includes: American Indian, Alaska Native, Asian, Native Hawaiian, and other Pacific Islander.

require public support and political will¹⁵ and our findings suggest that the public support for street-scale urban design exists in the U.S. The existence of differences in levels of public support by demographic characteristics stresses the importance of tailoring community-based programs aimed at influencing street-scale urban design policies and/or practices.

Our findings are in agreement with others that have examined public support for physical activity policies. Studies similar to ours that examined public attitudes regarding policies that may enhance physical activity have reported a high prevalence of support. Brownson et al found a high level of public support among U.S. adults for the use of government funds to provide areas where they can engage in physical activity, including walking/jogging trails (90.2%) and bicycle paths (89.1%), and for zoning requirements that would include walking and biking paths (85.8%).⁶ Handy et al found high levels of support (59%) for traditionally designed communities that can offer enhancements to physical activity opportunities.⁹ In rural Missouri, most individuals favored zoning regulations (85.1%) and use of government funds to support physical activity (77.4%)⁷ and in Oklahoma researchers found that over 70% of respondents supported better enforcement of traffic laws and use of state monies to create more sidewalks and enhance the safety of walking.⁸

We found that some population subgroups were more likely to rate neighborhood features as highly important (eg, adults 65 years and older, and those with lower education levels). However, they were either less likely (eg, those with lower education levels) or as likely (eg, adults 65 years and older) to be willing to take action as their respective counterparts. Exceptions to this were the findings by race/ethnicity where non-Hispanic blacks and Hispanics were more likely to rate neighborhood features as having high importance, and were more likely to be willing to take civic action than non-Hispanic whites. This finding suggests that street-scale urban design policies may be an especially viable strategy for encouraging physical activity among minority communities, which are more likely to have lower levels of physical activity than non-Hispanic whites.^{16,17} Identifying how attitudes and willingness to take action differ by demographic characteristics can help to pinpoint those community members most likely to assist in aspects of policy promotion, development, and implementation.

Regardless of demographic differences, we found that how an individual rates the importance of neighborhood features was most strongly associated with his or her willingness to take civic action and that higher levels of rated importance were associated with willingness to do activities of higher commitment. If rated importance in a community is low, an initial step may be to determine why community support is low. Perhaps street-scale urban design features are not important to individuals' physical activity because they are active through other physical

activity supports, they are not aware of the connection between neighborhood features and physical activity, or they do not see these features as important because they are inactive. For communities with low support, it may be important to begin with efforts to increase support by educating people about the importance of neighborhood features. These efforts can dovetail with those of other groups (eg, community crime prevention organizations, schools, and environmental groups) to foster an appreciation of the importance of street-scale improvements by creating combined messages that highlight the connections between street-scale urban design and physical activity,¹ crime prevention,¹⁸ decreased pollution,¹⁹ and improved sense of community.¹⁹ In addition to changing the perceived importance of individuals, these efforts may directly reach policymakers²⁰ and thereby influence policy. In communities that view street-scale urban design features as highly important and are willing to take civic action to improve neighborhood features, it may be useful to organize community members into coalitions. Creating coalitions across community organizations and agencies can help to influence local policy and resource expenditure²¹ and often can result in increased community empowerment and sustainability.²² Potential barriers to street-scale urban design policies that communities will need to address include the expense of changing existing streetscapes and the need for careful planning and coordination among urban planners, architects, engineers, developers, and public health professionals.¹ Making changes to street-scale urban design brings many advantages, including the creation of enduring changes that last for the life of the structures and that designs have a potential influence on most, if not all, of those living in the community.

Our survey questioned individuals about how important neighborhood features were to the amount of physical activity they normally get. Future researchers may wish to examine the rated importance of neighborhood features by people's perceptions of whether their neighborhoods hinder or promote physical activity and by whether individuals are physically active. Different associations may be observed when these groups are separated. We observed that adults who were physically active were more likely to rate neighborhood features as having high importance and previous research has found that an increased level of physical activity is associated with a person's desire to live in an activity-friendly community.¹⁰ It would be interesting to examine how people's perceptions of whether features hinder or promote physical activity vary based on individual activity levels.

Our study did not include any measurements about respondents' level of access to physical activity facilities or about the presence and quality of their current neighborhood features. Access to physical activity facilities may influence individual's rated importance of street-scale urban design features. If an individual has access to other physical activity facilities (eg, recreation center,

local park, fitness center), then neighborhood features may not be important to them for obtaining physical activity. In addition, collecting data on what specific street-scale urban design features individuals have access to or would like access to in order to increase their physical activity level may help communities further focus their promotional efforts and identify priority areas for intervention. A future direction may also be to compare rated importance with community audits of street-scale urban design features to determine how the presence and quality of the features relate to their perceived importance.

This study has both strengths and limitations. Study limitations include the sample selection bias that may be associated with the use of data from a mail panel survey of volunteers. However, previous research that has compared results between random-digit dial and panel approaches has found a general equivalence between results, suggesting that findings from panel studies are as acceptable as those using respondents selected randomly for telephone surveys.^{11,23} Our sample was drawn from a large, community-dwelling population. The large sample allowed us to look at differences by many different demographic characteristics. Our survey questions have limitations. The survey question assessing the importance of neighborhood features in determining how much physical activity a respondent normally gets did not define physical activity; therefore it is not possible to know if respondents included such things as active transportation. In addition, the civic action question was limited to 4 responses and may not have captured all civic actions that individuals may be willing to do (eg, attend a community planning meeting, join a group or coalition). Finally, our survey questions assessing public support did not have any information available related to their reliability and validity. A final limitation of this study is that it is cross-sectional and, therefore, its findings cannot identify causality. Although rated importance of neighborhood features on physical activity was associated with willingness to take civic action to improve neighborhood features, this association was not causal. However, previous literature has suggested that awareness leads to action.²⁴ Future work may wish to examine the impact of the rated importance of neighborhood features and of willingness to take action on actually taking action and on the implementation of street-scale urban design policy within a community.

Joint efforts across disciplines will be needed to develop, implement, and maintain policy interventions related to enhancing physical activity.²⁵ Across communities, increasing awareness of the importance of neighborhood features may be the first step in gaining public support for programs targeting street-scale urban design practices and policies. Demographic differences exist in public support for local street-scale urban design practices and policies, and these differences should be taken into account when designing community programs targeting street-scale urban design. The high level of support we

report in this study is encouraging and can begin to foster the commitment of policymakers and local communities to promoting the improvement of neighborhood features through local street-scale urban design policy.

Acknowledgments

The authors would like to thank Kelly Mattran for her assistance in compiling the data. The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

References

1. Heath GW, Brownson RC, Kruger J, et al. The effectiveness of urban design and land use and transport policies and practices to increase physical activity: a systematic review. *J Phys Act Health*. 2006;3(Suppl 1):S55–S76.
2. Guide to Community Preventive Services. Promoting physical activity: environmental and policy approaches; 2009. www.thecommunityguide.org/pa/environmental-policy/index.html. Accessed April 14, 2010.
3. Task Force on Community Preventive Services. Recommendations to increase physical activity in communities. *Am J Prev Med*. 2002;22(4, Suppl 1):67–72.
4. Page BI, Shapiro RY. Effects of public-opinion on policy. *Am Polit Sci Rev*. 1983;77(1):175–190.
5. Lum KL, Barnes RL, Glantz SA. Enacting tobacco taxes by direct popular vote in the United States: lessons from 20 years of experience. *Tob Control*. 2009;18(5):377–386.
6. Brownson RC, Baker EA, Housemann RA, Brennan LK, Bacak SJ. Environmental and policy determinants of physical activity in the United States. *Am J Public Health*. 2001;91(12):1995–2003.
7. Brownson RC, Schmid TL, King AC, et al. Support for policy interventions to increase physical activity in rural Missouri. *Am J Health Promot*. 1998;12(4):263–266.
8. Heesche KC, Han JL. Association between demographic, perceptual, and behavioral factors and support for policies encouraging active transports. *J Phys Act Health*. 2007;4:261–277.
9. Handy S, Sallis JF, Weber D, Maibach EW, Hollander M. Is support for traditionally designed communities growing? *J Am Plann Assoc*. 2008;74(2):209–221.
10. Librett JJ, Yore MM, Schmid TL, Kohl HW. Are self-reported physical activity levels associated with perceived desirability of activity-friendly communities? *Health Place*. 2007;13(3):767–773.
11. Pollard W. Use of consumer panel survey data for public health communication planning: an evaluation of survey results. In: *American Statistical Association. Proceedings of the Section on Health Policy Statistics*. Alexandria, VA: American Statistical Association 2002:2720–2724.
12. NHLBI Obesity Education Initiative Expert Panel on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults. Executive summary. *Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults*. National Institutes of Health; National Heart, Lung, and Blood Institute; National Institute of Diabetes and Digestive and Kidney Diseases; 1998. NIH Publication 98-4083.

13. National Institute for Clinical Excellence (NICE). Physical activity and the environment: guidance on the promotion and creation of physical environments that support increased levels of physical activity. <http://www.nice.org.uk/PH008>. Accessed April 14, 2010.
14. Active Living Research. Active transportation: making the link from transportation to physical activity and obesity; 2009. http://www.activelivingresearch.org/files/ALR_Brief_ActiveTransportation.pdf. Accessed April 14, 2010.
15. Sallis JF, Cervero RB, Ascher W, Henderson KA, Kraft MK, Kerr J. An ecological approach to creating active living communities. *Annu Rev Public Health*. 2006;27:297–322.
16. Carlson SA, Densmore D, Fulton JE, Yore MM, Kohl HW, 3rd. Differences in physical activity prevalence and trends from 3 U.S. surveillance systems: NHIS, NHANES, and BRFSS. *J Phys Act Health*. 2009;6(Suppl 1):S18–S27.
17. Pleis JR, Lucas JW. Summary health statistics for U.S. adults: National Health Interview Survey, 2007. *Vital Health Stat*. 2009;10(240).
18. Painter K. The influence of street lighting improvements on crime, fear and pedestrian street use, after dark. *Landsc Urban Plan*. 1996;35(2-3):193–201.
19. Pollard T. Policy prescriptions for healthier communities. *Am J Health Promot*. 2003;18(1):109–113.
20. Leyden KM, Reger-Nash B, Bauman A, Bias T. Changing the hearts and minds of policy makers: an exploratory study associated with the West Virginia Walks campaign. *Am J Health Promot*. 2008;22(3):204–207.
21. Mcleroy KR, Bibeau D, Steckler A, Glanz K. An ecological perspective on health promotion programs. *Health Educ Q*. 1988;15(4):351–377.
22. Bopp M, Fallon E. Community-based interventions to promote increased physical activity: a primer. *Appl Health Econ Health Policy*. 2008;6(4):173–187.
23. Fisher L, Kane N. Consumer panelist versus random digit dial respondent performance revisited: how similar and how different? *Research on Research*. 2004; <http://www.synovate.com/whatwedo/online-panel-research/pdf/Synovate%20-%20Research%20on%20Research%20-%2064.pdf>. Accessed April 14, 2010.
24. Edwards RW, Jumper-Thurman P, Plested BA, Oetting ER, Swanson L. Community readiness: research to practice. *J Community Psychol*. 2000;28(3):291–307.
25. Schmid TL, Pratt M, Witmer L. A framework for physical activity policy research. *J Phys Act Health*. 2006;3(Suppl 1):S20–S29.